

Form PTO-1449		
ATTY DOCKET NO. 63-03	SERIAL NO. 10/717,218	FILING DATE November 19, 2003
APPLICANT Roark et al.		GROUP 1724

APR 23 2004

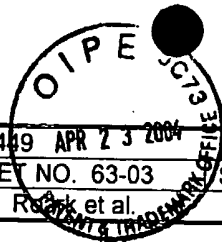
U.S. PATENT DOCUMENTS

Exmr. Initial	Document Number	Date	Name	Class	Subclass	Filing Date if Appropriate
RB	2,024,620	02/25/58	De Rosset	183	2	
RB	2,958,391	11/01/60	De Rosset	183	2	
RB	3,350,846	11/07/67	Makrides, et al	55	16	
RB	3,393,098	07/16/68	Hartner et al.	136	86	
RB	4,313,013	01/26/82	Harris	585	818	
RB	4,468,235	08/28/84	Hill	55	16	
RB	4,496,373	01/29/85	Behr et al.	55	16	
RB	4,536,196	08/20/85	Harris	55	16	
RB	4,589,891	05/20/86	Iniotakis	55	158	
RB	4,689,150	08/25/87	Abe et al.	210	490	
RB	4,699,637	10/13/87	Iniotakis	55	158	
RB	4,810,485	03/07/89	Marianowski	423	648.1	
RB	4,857,080	08/15/89	Baker et al.	55	16	
RB	5,139,541	08/18/92	Bend	55	16	
RB	5,149,420	09/22/92	Buxbaum	205	219	
RB	5,171,822	12/15/92	Pater	528	188	
RB	5,215,729	06/01/93	Buxbaum	423	248	
RB	5,217,506	06/08/93	Bend	55	16	
RB	5,259,870	11/09/93	Bend	95	56	
RB	5,332,597	07/26/94	Carolan et al.	427	243	
RB	5,366,712	11/22/94	Violante et al.	423	248	
RB	5,393,325	02/28/95	Bend	95	56	
RB	5,498,278	03/12/96	Edlund	96	11	
RB	5,518,530	05/21/96	Sakai et al.	96	11	
RB	5,614,001	03/25/97	Kosake et al.	96	10	
RB	5,645,626	07/08/97	Edlund et al.	95	56	
RB	5,652,020	07/29/97	Collins et al.	427	230	
RB	5,674,301	10/07/97	Sakai et al.	48	61	
RB	5,738,708	04/14/98	Peachey et al.	95	56	
RB	5,821,185	10/13/98	White et al.	502	4	
RB	5,931,987	08/03/99	Buxbaum	95	55	
RB	5,980,989	11/09/99	Takahashi et al.	427	294	
RB	6,037,514	03/14/00	White et al.	585	520	
RB	6,066,592	05/23/00	Kawae et al.	502	439	
RB	6,183,543	02/06/01	Buxbaum	96	11	
RB	6,214,090	04/10/01	Dye	95	56	
RB	6,235,417	05/22/01	Wachsman et al.	429	17	
RB	6,281,403	08/28/01	White et al.	585	658	
RB	6,296,687	10/02/01	Wachman	95	55	
RB	6,350,297	02/26/02	Doyle	95	55	
RB	6,461,408	10/08/02	Buxbaum	95	55	
RB	6,475,268	11/05/02	Thornton	96	11	
RB	6,478,853	11/12/02	Hara et al.	95	56	
RB	6,547,858	04/15/03	Edlund et al.	96	4	
RB	6,569,226	05/27/03	Dorris et al.	95	56	

EXAMINER Robert H. Spitzer

DATE CONSIDERED November 16, 2004

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.



Form PTO-1449 APR 23 2004	ATTY DOCKET NO. 63-03	SERIAL NO. 10/717,218	FILING DATE November 19, 2003
APPLICANT Reak et al.	GROUP 1724		

R45	2003/0000387	01/02/03	Uemura	96	11	
R45	2002/0062738	05/30/02	Yoshida	96	11	
R45	2002/0020298	02/21/02	Drost et al.	96	11	

FOREIGN PATENT DOCUMENTS

Document Number	Date	Country	Class	Subclass	Translation Yes/No

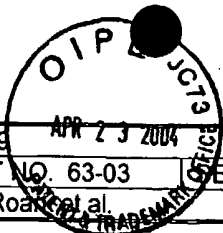
OTHER PRIOR ART (including Author, Title, Date, Pertinent Pages, etc.)

R45		Amandusson, H. Dissertation No.651, "Hydrogen Extraction with Palladium Based Membranes," Institute of Technology, Linkopings Universitet, Department of Physics and Measurement Technology, Linkoping, Sweden, (Forum Scientum, Linkoping, Sweden, 2000).
R45		Balachandran, U.; Lee, T. H.; Dorris, S. E., "Development of Mixed-Conducting Ceramic Membrane for Hydrogen Separation," In <i>Sixth International Pittsburgh Coal Conference</i> : Pittsburgh, PA, 1999.
R45		Balachandran, U.; et al., "Development of Dense Ceramic Membranes for Hydrogen Separation," In <i>26th International Technical Conference on Coal Utilization and Fuel Systems</i> : Clearwater, FL, March 5-8, 2001, pp 751-761
R45		Balachandran, U.; et al., "Current Status of Dense Ceramic Membranes for Hydrogen Separation," In <i>27th International Technical Conference on Coal Utilization and Fuel Systems</i> : Clearwater, FL, March 3-7, 2002, pp 1155-1165
R45		Balachandran, U.; et al., M. "Development of mixed-conducting oxides for gas separation," <i>Solid State Ionics</i> 1998, 108, 363-370.
R45		Balachandran, U.; et al., "Development of Mixed-Conducting Dense Ceramic Membranes for Hydrogen Separation," In <i>Proceedings of the Fifth International Conference on Inorganic Membranes</i> : Nagoya, Japan, 1998.
R45		Benziger, J. B. (1991) "Thermochemical Methods for Reaction Energetics on Metal Surfaces," in: <i>Metal-Surface Reaction Energetics</i> , Edited by E. Shustorovich, (VCH Publishers, Weinheim, Germany) pp. 53-107.
R45		Beshers, D. N. (1973) "Diffusion of Interstitial Impurities," in: "Diffusion," (American Society for Metals, Metals Park, Ohio) pp. 209-240.
R45		Bonanos, N. et al., "Ionic Conductivity of Gadolinium-Doped Barium Cerate Perovskites," <i>Solid State Ionics</i> 1989, 35, 179-188.
R45		Bonanos, N. "Transport properties and conduction mechanism in high-temperature protonic conductors," <i>Solid State Ionics</i> 1992, 53-56, 967-974.
R45		Bonanos, N. "Transport Study of the Solid Electrolyte BaCe _{0.9} Gd _{0.1} O _{2.95} at High Temperatures," <i>J. Phys. Chem. Solids</i> 1993, 54, 867-870.
R45		Bonanos, N. et al. "Perovskite solid electrolytes: Structure, transport properties and fuel cell applications," <i>Solid State Ionics</i> 1995, 79, 161-170.
R45		Buxbaum, R. E.; Marker, T. L., "Hydrogen transport through non-porous membranes of palladium-coated niobium, tantalum and vanadium," <i>J. Mem. Sci.</i> 1993, 85, 29-38.
R45		Chary, A. S.; Reddy, S. N. "Effect of Structural Changes on DC Ionic Conductivity of Rubidium Nitrate Single Crystals," <i>Phys. Stat. Sol.</i> 1998, 208, 349-352.
R45		Heed, B. et al., "Proton conductivity in fuel cells with solid sulphate electrolytes," <i>Solid State Ionics</i> 1991, 46, 121-125.

EXAMINER Robert H. Spitzer

DATE CONSIDERED November 16, 2004

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.



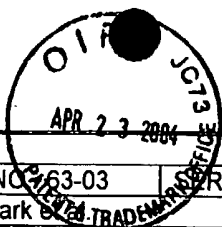
Form PTO-1449	APR 23 2004		
ATTY DOCKET NO. 63-03	SERIAL NO. 10/717,218	FILING DATE November 19, 2003	
APPLICANT Roark et al.	GROUP 1724		

RHS		Heinze, S.; et al., "Relation between grain size and hydrogen diffusion coefficient in an industrial Pd-23% Ag alloy," <i>Solid State Ionics</i> 1999, 122, 51-57.
RHS		Iwahara, H.; et al., "Proton Conduction in Sintered Oxides and its Application to Steam Electrolysis for Hydrogen Production," <i>Solid State Ionics</i> 1981, 3/4, 359-363.
RHS		Iwahara, H.; et al., "Proton Conduction in Sintered Oxides Based on BaCeO ₃ ," <i>J. Electrochem. Soc.</i> 1988, 135, 529-533.
RHS		Iwahara, H.; et al., "High Temperature Solid Electrolyte Fuel Cells Using Perovskite-Type Oxide Based on BaCoO ₃ ," <i>J. Electrochem. Soc.</i> 1990, 137, 462-465.
RHS		Iwahara, H.; et al., "High-temperature C ₁ -gas fuel cells using proton-conducting solid electrolytes," <i>J. Appl. Electrochem.</i> 1989, 19, 448-452.
RHS		Iwahara, H. "Oxide-ionic and protonic conductors based on perovskite-type oxides and their possible applications," <i>Solid State Ionics</i> 1992, 52, 99-104
RHS		Iwahara, H. et al., "An electrochemical steam pump using a proton conducting ceramic," <i>J. Appl. Electrochem.</i> 1996, 26, 829-832
RHS		Kreuer, K. D. et al., "H/D isotope effect of proton conductivity and proton conduction mechanism in oxides," <i>Solid State Ionics</i> 1995, 77, 157-162.
RHS		Kreuer, K. D. "On the development of proton conducting materials for technological applications," <i>Solid State Ionics</i> 1997, 97, 1-15.
RHS		Kroger, F. A. "Detailed Description of Crystalline Solids; Imperfections," <i>The Chemistry of Imperfect Crystals</i> ; Chapter 7, North Holland Publishing Co.: Amsterdam, 1964, pp 192-207.
RHS		Lee, W.; Nowick, A. S. "Protonic Conduction in Acceptor-Doped KTaO ₃ Crystals," <i>Solid State Ionics</i> 1986, 18/19, 989-993.
RHS		Liang, K. C.; Nowick, A. S. "High-temperature protonic conduction in mixed perovskite ceramics," <i>Solid State Ionics</i> 1993, 61, 77-81.
RHS		Lunden, A.; Mellander, B.-E.; Zhu, B. "Mobility of Protons and Oxygen Ions in Lithium Sulfate and Other Oxyacid Salts," <i>Acta. Chem. Scand.</i> 1991, 45, 981-982.
RHS		Munch, W.; et al., "A quantum molecular dynamics study of proton conduction phenomena in BaCeO ₃ ," <i>Solid State Ionics</i> 1996, 86-88, 647-652.
RHS		Munch, W. et al. J. "A quantum molecular dynamics study of the cubic phase of BaTiO ₃ and BaZrO ₃ ," <i>Solid State Ionics</i> 1997, 97, 39-44.
RHS		Nishimura, C. et al., "Hydrogen Permeation Characteristics of Vanadium-Nickel Alloys," <i>M. Mat. Trans.</i> 1991, 32, 501-507.
RHS		Nishimura, C. et al., "V-Ni alloy membranes for hydrogen purification," <i>J. Alloys and Compounds</i> January 2002, 330-332, 902-906.
RHS		Norby, T.; Larring, Y. "Mixed hydrogen ion-electronic conductors for hydrogen permeable membranes," <i>Solid State Ionics</i> 2000, 136-137, 139-148.
RHS		Norby, T.; Larring, Y., "Concentration and Transport of Protons and Oxygen Defects in Oxides," In <i>Ceramic Oxygen Ion Semiconductors and Their Applications</i> ; Steele, B. C. H., Ed.; The Institute of Materials, 1996, pp 83-93
RHS		Norby, T., "Proton Conduction in Oxides," <i>Solid State Ionics</i> 1990, 40/41, 857-862
RHS		Peachey, N. M. et al., "Composite Pd/Ta metal membranes for hydrogen separation," <i>J. Mem. Sci.</i> 1996, 111, 123-133.
RHS		Shima, D.; Haile, S. M. "The influence of cation non-stoichiometry on the properties of undoped and gadolinia-doped barium cerate," <i>Solid State Ionics</i> 1997, 97, 443-445

EXAMINER Robert H. Spitzer

DATE CONSIDERED November 16, 2004

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.



Form PTO-1449		
ATTY DOCKET NO. 3-63-03	SERIAL NO. 10/717,218	FILING DATE November 19, 2003
APPLICANT Roark & Co.		GROUP 1724

RHS		Siriwardane, R. V. Jr., et al., "Characterization of ceramic hydrogen separation membranes with varying nickel concentrations," <i>Appl. Surf. Sci.</i> 2000 , <i>167</i> , 34-50.
RHS		Stenzenberger, H.D., "Addition Polyimides," in: <i>Advances in Polymer Science - High Performance Polymers</i> , Vol. 117; Edited by P.M. Hergenrother, (Springer-Verlag Berlin Heidelberg, 1994), pp. 165-220
RHS		Takekoshi, T., "Synthesis of Polyimides," (1996) <i>Polyimides Fundamentals and Applications</i> , Chapter 2, (Marcel Dekker, Inc., New York, New York), pp. 7-44.
RHS		Van der Merwe, J.H. (1984) "Recent Developments in the Theory of Epitaxy," in: "Chemistry and Physics of Solid Surfaces V," Edited by R. Vanselow and R. Howe, Springer-Verlag, Berlin, 1984) pp. 365-401.
RHS		Yajima, T.; Iwahara, H. "Studies on behavior and mobility of protons in doped perovskite-type oxides: (I) In situ measurement of hydrogen concentration in $\text{SrCe}_{0.95}\text{Yb}_{0.05}\text{O}_{3-\alpha}$ at high temperature," <i>Solid State Ionics</i> 1992 , <i>50</i> , 281-286.
RHS		Yajima, T. et al. "Proton conduction in sintered oxides based on CaZrO_3 ," <i>Solid State Ionics</i> 1991 , <i>47</i> , 271-275.
RHS		Yamakawa, K. et al., "Hydrogen permeability measurement through Pd, Ni and Fe membranes," <i>J. Alloys and Compounds</i> May 2001 , <i>321</i> , 17-23.
RHS		Zhang, Y. et al., "Hydrogen permeation characteristics of vanadium-aluminium alloys," <i>Scripta Materialia</i> November 2002 , <i>47</i> , 601-606.
RHS		Zhu, B.; Mellander, B.-E. "Proton conduction in salt-ceramic composite systems," <i>Solid State Ionics</i> 1995 , <i>77</i> , 244-249.
RHS		Zhu, B.; Mellander, B.-E. "Proton Conducting Composite Materials at Intermediate Temperatures," <i>Ferroelectrics</i> 1995 , <i>167</i> , 1-8.
RHS		Zhu, B. et al. "Structure and ionic conductivity of lithium sulphate-aluminum oxide ceramics," <i>Solid State Ionics</i> 1994 , <i>70/71</i> , 125-129.
RHS		Zhu, B. <i>Solid State Ionics</i> 1999 , "Intermediate temperature proton conducting salt-oxide composites," <i>125</i> , 397-405.
RHS		Zhu, B.; Mellander, B.-E., "Ionic Conductivities of Nitrate-Based Oxide Materials for Solid State Fuel Cells," In <i>High Temperature Electrochemical Behavior of Fast Ion and Mixed Conductors</i> ; Poulsen, F. W., Bentzen, J. J., Jacobson, T., Skou, E., Ostergard, M. J. L., Eds.: Roskilde, 1993 , p 495
RHS		Zhu, B.; Mellander, B.-E. "Proton conducting materials based on hydrofluorides," <i>J. Mat. Sci. Lett.</i> 2000 , <i>19</i> , 971-973
RHS		Zhu, B. "Applications of hydrofluoride ceramic membranes for advanced fuel cell technology," <i>Int. J. Energy Res.</i> 2000 , <i>24</i> , 39-49
RHS		Zhu, B. et al. "Intermediate temperature fuel cells using alkaline and alkaline earth fluoride-based electrolytes," <i>Solid State Ionics</i> 2000 , <i>135</i> , 503-512

EXAMINER Robert H. Spitzer

DATE CONSIDERED November 16, 2004

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

AUG 16 2004

Sheet 1 of 2

Substitute for form 19/PTO, based on PTO/SB/08A and 08B INFORMATION DISCLOSURE STATEMENT BY APPLICANT	Application Number	10717,218
	Filing Date	November 19, 2003
	First Named Inventor	Roark
	Art Unit	1724
	Examiner Name	Spitzer, Robert H.
	Attorney Docket Number	63-03

U.S. PATENT DOCUMENTS

Examiner Initial*	Cite No. ¹	Document Number (US-)	Publication Date (MM-DD-YYYY)	Name	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear (or entire document unless noted otherwise)
RHS		3,246,450	04/19/66	Stern et al.	
RHS		4,804,475	02/14/89	Sirinyan et al.	
RHS		6,152,987	11/28/00	Ma et al.	
RHS		6,187,157	02/13/01	Chen et al.	
RHS		6,379,514	04/30/02	Schulte et al.	
RHS		6,572,683	06/03/03	Yoshida et al.	
RHS		6,641,647	11/04/03	Uemura et al.	
RHS		6,649,559	11/18/03	Drost et al.	

FOREIGN PATENT DOCUMENTS

Examiner Initial*	Cite No. ¹	Foreign Patent Document Number (include WIPO country code)	Publication Date (MM-DD-YYYY)	Name	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear (or entire document unless noted otherwise)	T ²

NON-PATENT LITERATURE DOCUMENTS

Examiner Initial*	Cite No. ¹	REFERENCE	T ²
		Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	
RHS		Buxbaum, R.E. and Kinney, A.B. (1996), "Hydrogen Transport through Tubular Membranes of Palladium-Coated Tantalum and Niobium," Ind. Eng. Chem. Res. 35:530-537	
RHS		Edlund, D.J. and Pledger, W.A. (1993), "Thermolysis of hydrogen sulfide in a metal-membrane reactor," J. Membr. Sci. 77:255-264	
RHS		Hara, S. et al. (July 2002), "Hydrogen permeation through palladium-coated amorphous Zr-M-Ni (M = Ti, Hf) alloy membranes," Desalination 144:115-120	
RHS		Moss, T.S. et al. (1998), "Multilayer Metal Membranes for Hydrogen Separation," Int. J. Hydrogen Energy 23(2):99-106	
RHS		Nishimura, C. et al. (1994), "Hydrogen permeation characteristics of vanadium-molybdenum alloys," Trans. Mat. Res. Soc. Jpn. 18B:1273-1276	
RHS		Nishimura, C. et al. (1999), "Hydrogen permeation through magnesium," J. Alloys Compounds 293-295:329-333	

Examiner Signature	Robert H. Spitzer	Date Considered	Nov. 16, 2004
--------------------	-------------------	-----------------	---------------

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

¹Applicant's unique citation designation number (optional).

²Applicant is to place a check mark here or "x" if English language Translation is attached.

